flowPIM0+PFC 2nd — Output Inverter Application — 600V/15A

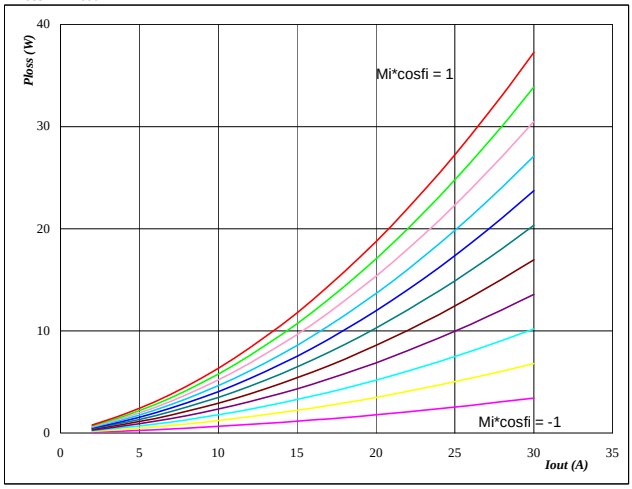
General conditions

3phase SPWM		
V_{GEon}	=	15 V
V_{GEoff}	=	-15 V
R_{gon}	=	16 Ω
R_{goff}	=	16 Ω

Figure 1 IGBT

Typical average static loss as a function of output current

$P_{loss} = f(I_{out})$



At

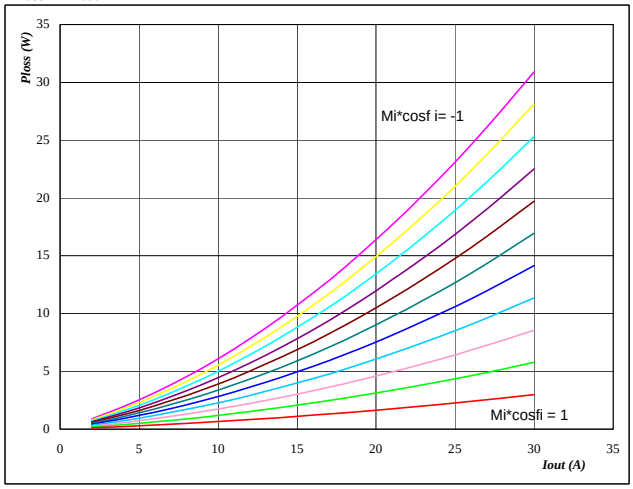
T_j = 125 ℃

Mi*cosφ from -1 to 1 in steps of 0,2

Figure 2 FWD

Typical average static loss as a function of output current

$P_{loss} = f(I_{out})$



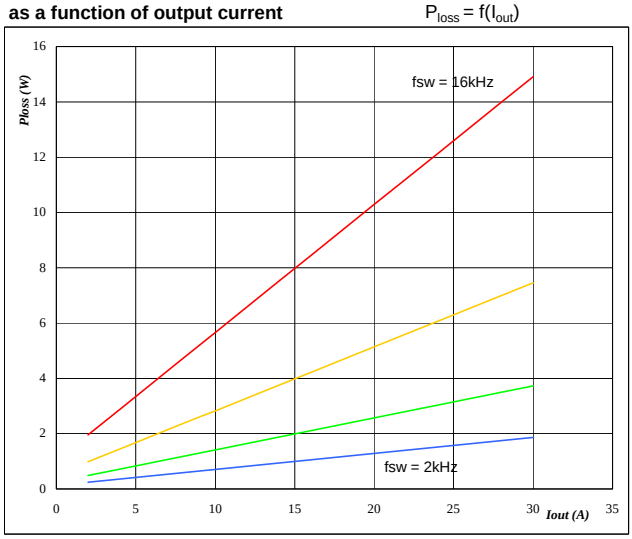
At

T_j = 125 ℃

Mi*cosφ from -1 to 1 in steps of 0,2

Figure 3 IGBT

Typical average switching loss as a function of output current $P_{loss} = f(I_{out})$



At

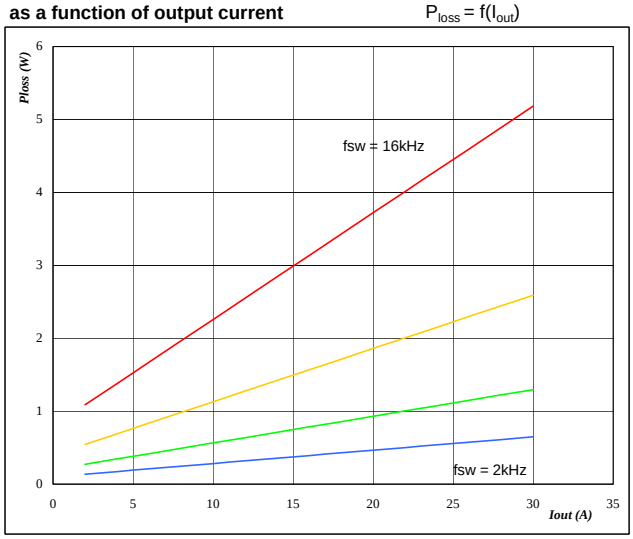
T_j = 125 ℃

DC link = 400 V

f_{sw} from 2 kHz to 16 kHz in steps of factor 2

Figure 4 FWD

Typical average switching loss as a function of output current $P_{loss} = f(I_{out})$



At

T_j = 125 ℃

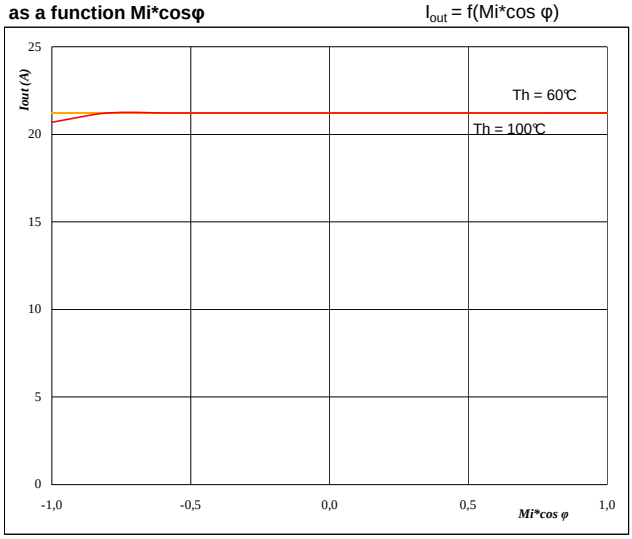
DC link = 400 V

f_{sw} from 2 kHz to 16 kHz in steps of factor 2

flowPIM0+PFC 2nd	**Output Inverter Application**	600V/15A

Figure 5 Phase

Typical available 50Hz output current as a function Mi*cosφ $I_{out} = f(Mi*\cos\varphi)$

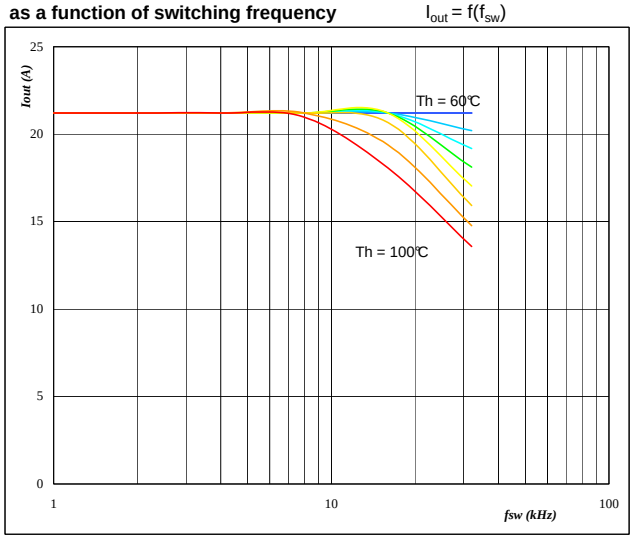


At

T_j =	125	℃
DC link =	400	V
f_{sw} =	4	kHz
T_h from	60 ℃ to 100 ℃ in steps of 5 ℃	

Figure 6 Phase

Typical available 50Hz output current as a function of switching frequency $I_{out} = f(f_{sw})$

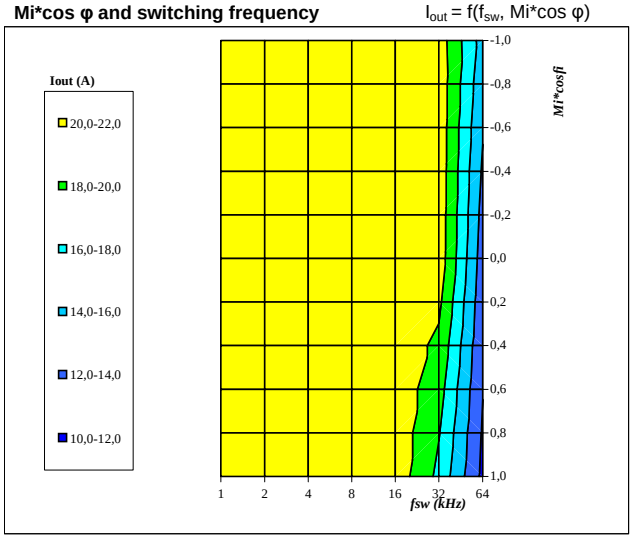


At

T_j =	125	℃
DC link =	400	V
Mi*cos φ =	0,8	
T_h from	60 ℃ to 100 ℃ in steps of 5 ℃	

Figure 7 Phase

Typical available 50Hz output current as a function of Mi*cos φ and switching frequency $I_{out} = f(f_{sw}, Mi*\cos\varphi)$

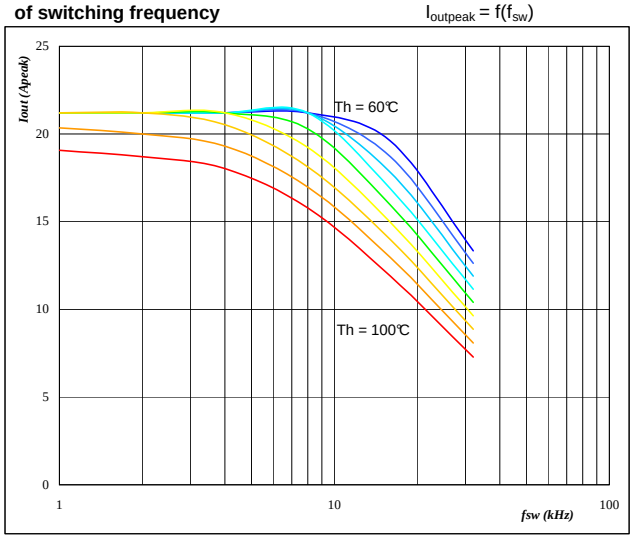


At

T_j =	125	℃
DC link =	400	V
T_h =	80	℃

Figure 8 Phase

Typical available 0Hz output current as a function of switching frequency $I_{outpeak} = f(f_{sw})$



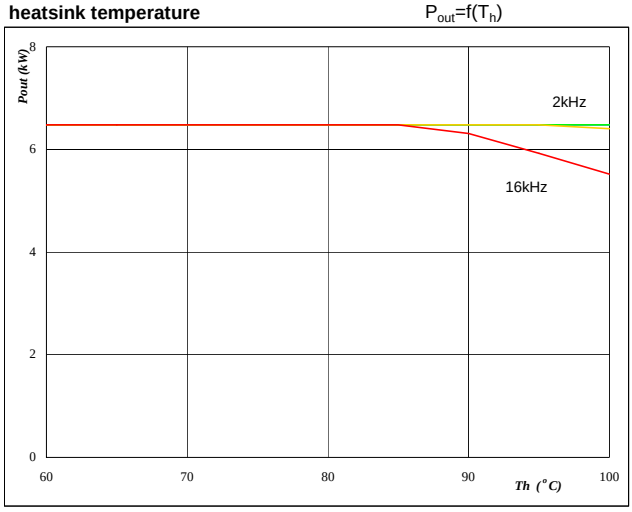
At

T_j =	125	℃
DC link =	400	V
T_h from	60 ℃ to 100 ℃ in steps of 5 ℃	
Mi =	0	

flowPIM0+PFC 2nd — Output Inverter Application — 600V/15A

Figure 9 Inverter

Typical available peak output power as a function of heatsink temperature $P_{out}=f(T_h)$

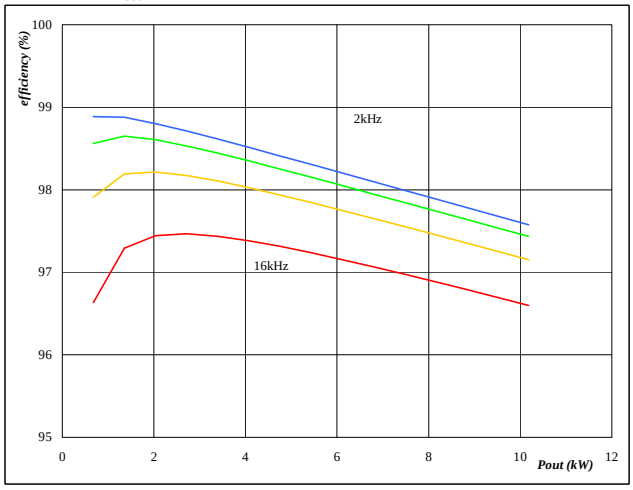


At

T_j =	125	℃
DC link =	400	V
Mi =	1	
cos φ=	0,80	
f_{sw} from	2 kHz to 16 kHz in steps of factor 2	

Figure 10 Inverter

Typical efficiency as a function of output power efficiency=f(P_{out})

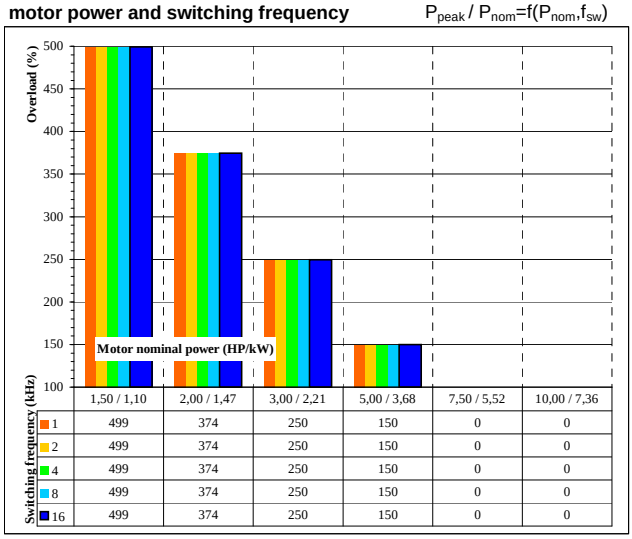


At

T_j =	125	℃
DC link =	400	V
Mi =	1	
cos φ=	0,80	
f_{sw} from	2 kHz to 16 kHz in steps of factor 2	

Figure 11 Inverter

Typical available overload factor as a function of motor power and switching frequency $P_{peak} / P_{nom}=f(P_{nom},f_{sw})$



Switching frequency (kHz)	1,50 / 1,10	2,00 / 1,47	3,00 / 2,21	5,00 / 3,68	7,50 / 5,52	10,00 / 7,36
1	499	374	250	150	0	0
2	499	374	250	150	0	0
4	499	374	250	150	0	0
8	499	374	250	150	0	0
16	499	374	250	150	0	0

At

T_j =	125	℃
DC link =	400	V
Mi =	1	
cos φ=	0,8	
f_{sw} from	1 kHz to 16kHz in steps of factor 2	
T_h =	80	℃
Motor eff =	0,85	

flowPIM0+PFC 2nd	**Boost PFC Application**	600V/15A

General conditions

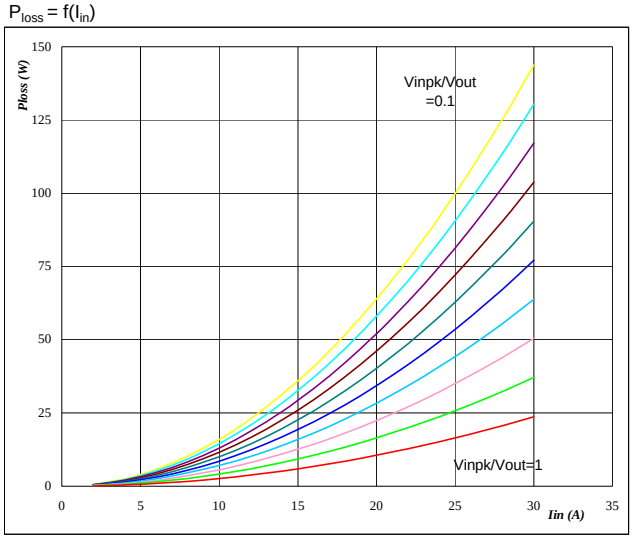
Boost PFC

V_{GEon} = 10 V
V_{GEoff} = 0 V
R_{gon} = 8 Ω
R_{goff} = 8 Ω
V_{in} = V_{inpk}*sinωt

Figure 1 MOSFET

Typical average static loss as a function of input current

$P_{loss} = f(I_{in})$



At

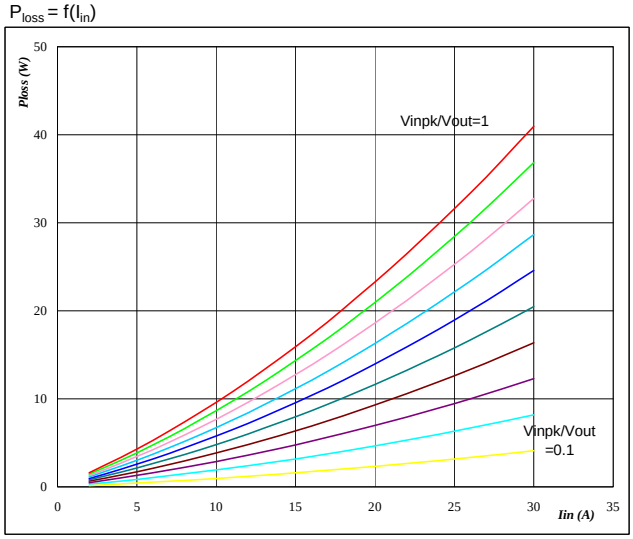
T_j = 125 ℃

Vinpk / Vout from 0,1 to 1 in steps of 0,1

Figure 2 FWD

Typical average static loss as a function of input current

$P_{loss} = f(I_{in})$



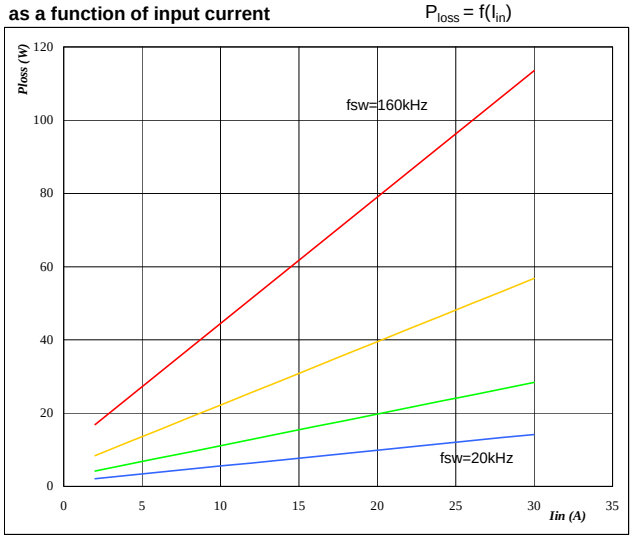
At

T_j = 125 ℃

Vinpk / Vout from 0,1 to 1 in steps of 0,1

Figure 3 MOSFET

Typical average switching loss as a function of input current $P_{loss} = f(I_{in})$



At

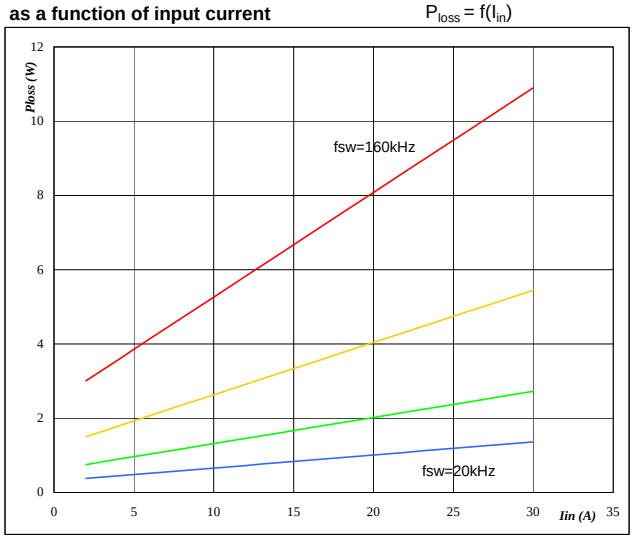
T_j = 125 ℃

DC link = 400 V

fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 4 FWD

Typical average switching loss as a function of input current $P_{loss} = f(I_{in})$



At

T_j = 125 ℃

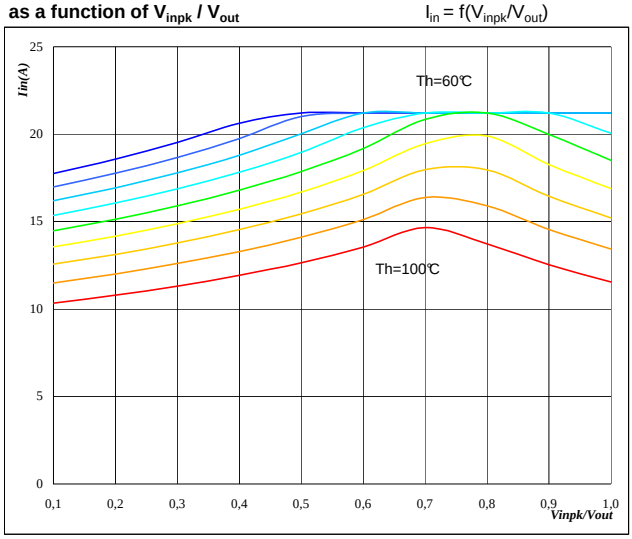
DC link = 400 V

fsw from 20 kHz to 160 kHz in steps of factor 2

flowPIM0+PFC 2nd	**Boost PFC Application**	600V/15A

Figure 5 PFC

Typical available input current as a function of V_{inpk} / V_{out} $I_{in} = f(V_{inpk}/V_{out})$



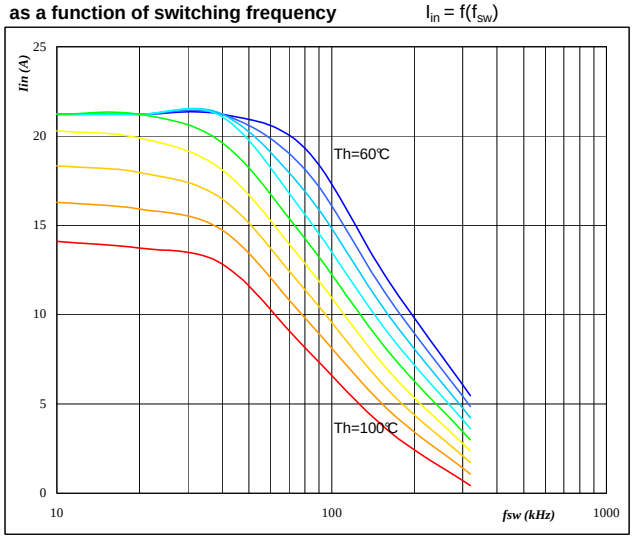
At

T_j =	125	℃
DC link =	400	V
fsw =	20	kHz

Th from 60 ℃ to 100 ℃ in steps of 5 ℃

Figure 6 PFC

Typical available input current as a function of switching frequency $I_{in} = f(f_{sw})$



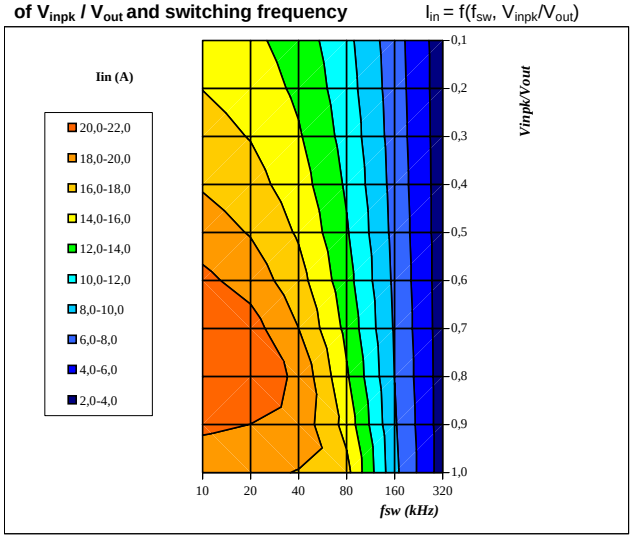
At

T_j =	125	℃
DC link =	400	V
V_{inpk}/V_{out} =	0,8	

Th from 60 ℃ to 100 ℃ in steps of 5 ℃

Figure 7 PFC

Typical available input current as a function of of V_{inpk} / V_{out} and switching frequency $I_{in} = f(f_{sw}, V_{inpk}/V_{out})$

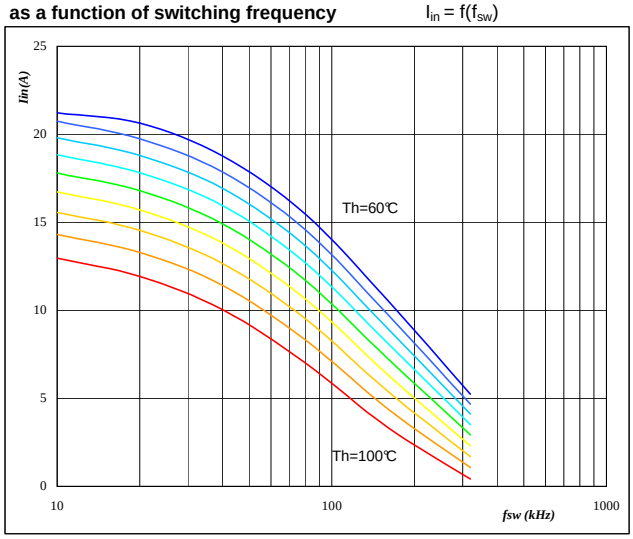


At

T_j =	125	℃
DC link =	400	V
T_h =	80	℃

Figure 8 PFC

Typical available input current as a function of switching frequency $I_{in} = f(f_{sw})$



At

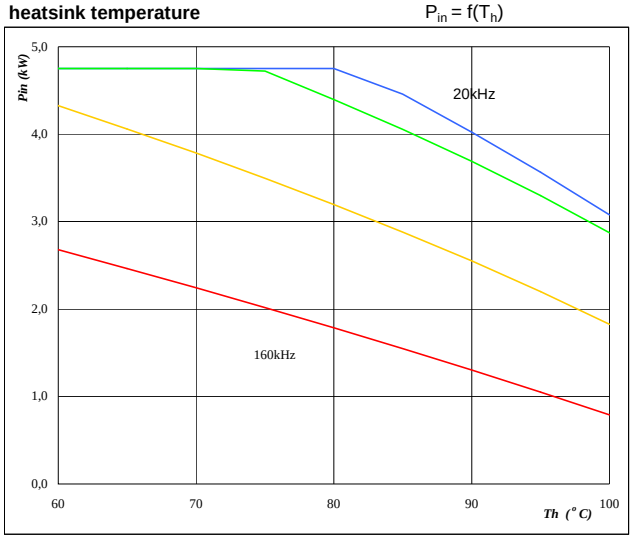
T_j =	125	℃
DC link =	400	V
V_{inpk}/V_{out} =	0,4	

Th from 60 ℃ to 100 ℃ in steps of 5 ℃

flowPIM0+PFC 2nd	**Boost PFC Application**	600V/15A

Figure 9 PFC

Typical available electric input power as a function of heatsink temperature $P_{in} = f(T_h)$



At

T_j = 125 ℃

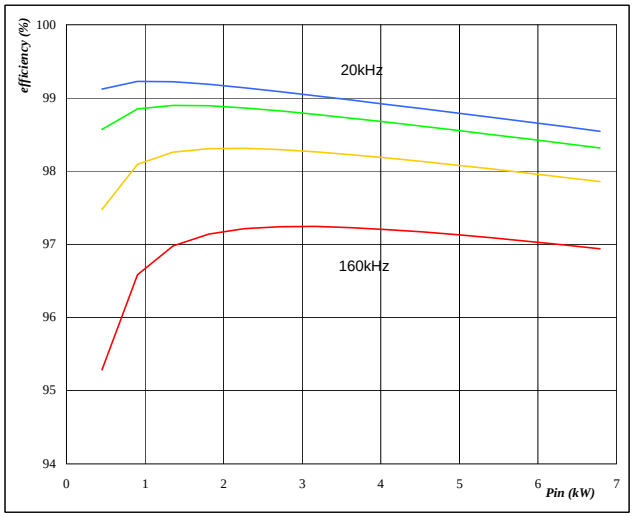
DC link = 400 V

V_{inpk}/V_{out} = 0,8 kHz

fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 10 PFC

Typical efficiency as a function of input power efficiency = $f(P_{in})$



At

T_j = 125 ℃

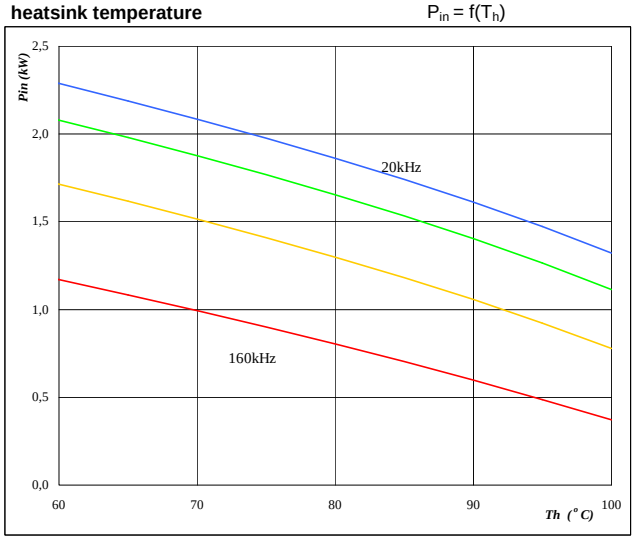
DC link = 400 V

V_{inpk}/V_{out} = 0,8 kHz

fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 11 PFC

Typical available electric input power as a function of heatsink temperature $P_{in} = f(T_h)$



At

T_j = 125 ℃

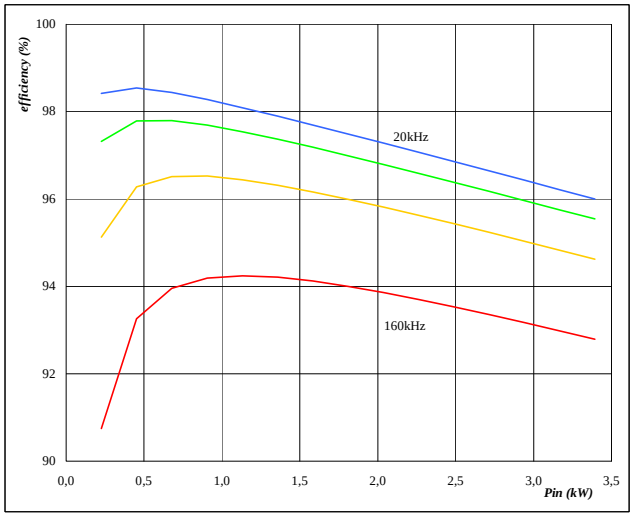
DC link = 400 V

V_{inpk}/V_{out} = 0,4

fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 12 PFC

Typical efficiency as a function of input power efficiency = $f(P_{in})$



At

T_j = 125 ℃

DC link = 400 V

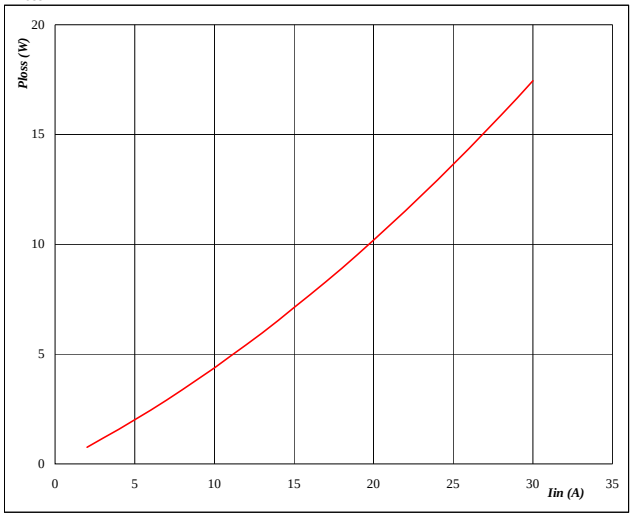
V_{inpk}/V_{out} = 0,4

fsw from 20 kHz to 160 kHz in steps of factor 2

flowPIM0+PFC 2nd | **Boost PFC Application** | **600V/15A**

Figure 13 Rectifier

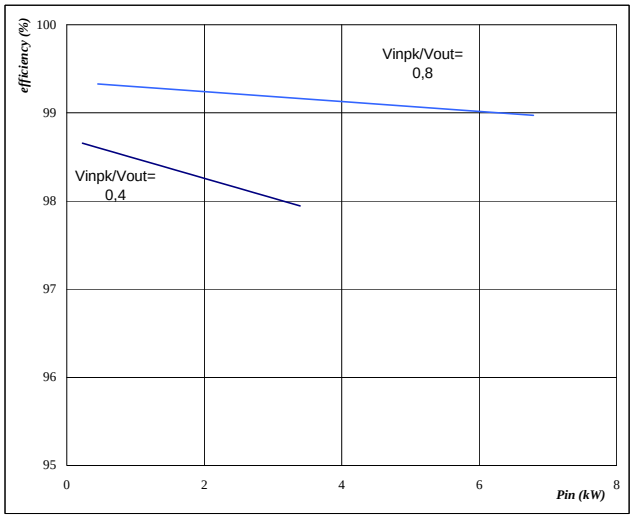
Typical average static loss as a function of input current
$P_{loss} = f(I_{in})$



At
T_j = 125 ℃

Figure 14 Rectifier Bridge

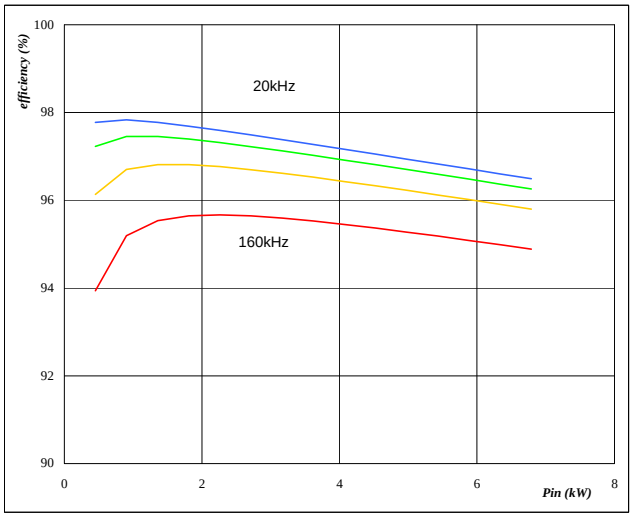
Typical efficiency as a function of input power
efficiency = $f(P_{in})$



At
T_j = 125 ℃

Figure 15 Overall

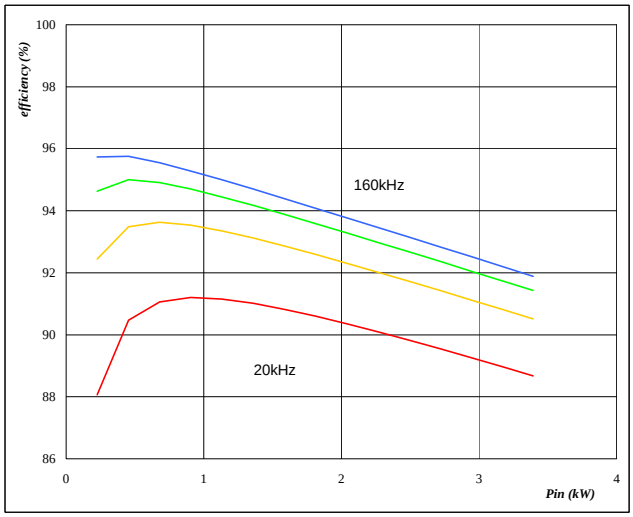
Typical efficiency as a function of input power
efficiency = $f(P_{in})$



At
T_j = 125 ℃
DC link = 400 V
V_{inpk}/V_{out} = 0,8 kHz
fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 16 Overall

Typical efficiency as a function of input power
efficiency = $f(P_{in})$



At
T_j = ℃
DC link = 400 V
V_{inpk}/V_{out} = 0,4 kHz
fsw from 20 kHz to 160 kHz in steps of factor 2